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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,174	03/24/2004	Yoshihiro Nakata	011293A	4205

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EXAMINER	
VO, HAI	

ART UNIT	PAPER NUMBER
1771	

DATE MAILED: 11/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/807,174	NAKATA ET AL.	
	Examiner	Art Unit	
	Hai Vo	1771	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The 102 art rejections over Yamamura et al (US 4,778,722) have been withdrawn in view of the present amendment. Yamamura does not teach or suggest a siloxane which is not a polymetallosiloxane.
2. The 102 art rejections based on JP 2001-127152 have been withdrawn because JP'152 does not teach a siloxane resin having a number ratio of carbon to silicon atoms in the main chain in the range of from 2:1 to 12:1. However, upon further consideration, new ground of rejection is made in view of JP'152 and Rutherford et al (US 6,318,124).
3. The art rejections over Rutherford in view of JP 2001-127152 are maintained.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification of the present invention does not teach a technical concept of excluding a polymetallosiloxane from a siloxane resin. The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph as

failing to comply with the written description requirement. See *Ex parte Grasselli*, 231 USPQ 393 (Bd. App. 1983), aff 'd mem., 738 F.2d 453 (Fed. Cir. 1984).

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. When an integer m is 1, the number ratio of carbon to silicon atoms in the main chain is 1, which is outside the range of from 2 to 12 as set out in the claims 1 and 2. The limitations within the claims are inconsistent with each other and thus render the claims indefinite.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-3, and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-127152 in view of Rutherford et al (US 6,318,124). JP'152 teaches a composition comprising a mixture of polycarboxilane, siloxane resin and solvent (claim 1). The composition contains 5 to 80 parts by weight of polycarbosilane within the claimed range [0029]. JP'152 does not specifically use the siloxane resin having the number ratio of carbon to silicon atoms in the main chain as set out in the claims. Rutherford teaches a coating composition comprising a compound that is

selected from a group consisting of a low organic siloxane, a high organic siloxane, a hydridiorganoorganosiloxane, a poly(arylene ether), a fluorinated poly(arylene) ether, a polyimide, a polycarbosilane and combinations thereof (column 10, lines 30-36). Rutherford teaches the polycarbosilane having a structure represented by formula $-[Si(R1)(R2)H]_x-$ or $-[Si(R8)(R9)(R10)]_w-$ (column 12, line 67 to column 13, lines 1-10). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the Rutherford polycarbosilane having a structure $-[Si(R1)(R2)H]_x-$ or $-[Si(R8)(R9)(R10)]_w-$ because the formulas are equivalent to $-[Si(R1)(R2)(CH2)]_m-$ and expectedly chemically combinable with the siloxane resin to provide an insulation film which is low in dielectric constant, superior in heat resistance and moisture resistance.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-127152 in view of Rutherford et al (US 6,318,124) as applied to claim 1 above, further in view of JP 64-009231. JP'152 does not specifically disclose how the siloxane resin is formed. JP'231, however, teaches siloxane polymer being formed from heat treatment of a mixture containing tetralkoxysilane and trialkoxysilane and alcohol is released from the mixture to form a siloxane polymer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method as taught by JP'231 to produce a siloxane polymer because such is known in the art and JP'231 provides necessary details to practice the invention of JP'152.

JP'231 does not specifically disclose the molar ratio of tetralkoxysilane and trialkoxysilane as well as the amount of alcohol removed from the mixture. However, such a variable would have been recognized by one skilled in the art as dependent upon the intended use of the product. As such, in the absence of unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the molar ratio in the range instantly claimed motivated by the desire to form a siloxane polymer within a short time, thereby giving an insulation film with improved heat resistance, adhesion and cracking resistance since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

11. Claims 1-3, and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rutherford et al (US 6,318,124) in view of JP 2001-127152. Rutherford teaches a coating composition comprising a compound that is selected from a group consisting of a low organic siloxane, a high organic siloxane, a hydridiorganoorganosiloxane, a poly(arylene ether), a fluorinated poly(arylene) ether, a polyimide, a polycarbosilane and combinations thereof (column 10, lines 30-36). Rutherford teaches the polycarbosilane having a structure represented by formula $-[Si(R1)(R2)H]_x-$ wherein R1 is an alkylene; R2 is H and x is from 10 to 100,000, which reads on Applicants' silicon compound having a structure represented by formula (2) (column 12, line 67 to column 13, lines 1-10). The siloxane resin has a structure wherein the mole percent of carbon is in the range of

about 15 mole percent to 25 mole percent within the claimed range (column 11, lines 50-51). Rutherford teaches the siloxane resin having a structure represented by formula $[H\text{-}SiO_{1.5}]_x[R\text{-}SiO_{1.5}]_y[SiO_{1.5}]_z$ (formula 4). When x = 1, y = 1, z = 6 and R is CH3, the hydrogen concentration is about 15 atom% based on the total atoms of the siloxane resin. Rutherford does not specifically disclose the coating composition made from a specific combination of a siloxane resin and a polycarbosilane. JP'152 teaches an insulation film which is low in dielectric constant and superior in heat resistance and moisture resistance made from a composition comprising a mixture of polycarbosilane, siloxane resin and a solvent. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form a coating compound made from a specific combination of a polycarbosilane and a siloxane resin motivated by the desire to provide an insulation film which is low in dielectric constant, superior in heat resistance and moisture resistance.

Rutherford does not specifically disclose the coating comprising a siloxane resin having a structure as set out in the claims. JP'152 teaches an insulation film made from a composition comprising a mixture of a polycarbosilane and a siloxane resin wherein the siloxane resin has a structure as set out in claim 3 and polycarbosilane has a structure $-[Si(R4)(R5)(CH2)]_x-$ which is similar to the structure of the Rutherford silicone compound $-[Si(R1)(R2)H]_x-$. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the siloxane resin of JP'152 (claim 1, formula 1) in combination with the polycarbosilane $-[Si(R1)(R2)H]_x-$ because such a combination is chemically

possible to achieve an insulation film which is low in dielectric constant, superior in heat resistance and moisture resistance.

Rutherford does not specifically disclose the weight ratio of polycarbosilane to siloxane resin in the coating composition. However, such a variable would have been recognized by one skilled in the art to achieve enhanced mechanical strength and improvements in film surface hydrophobicity. As such, in the absence of unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the molar ratio in the range instantly claimed motivated by the desire to achieve enhanced mechanical strength and improvements in film surface hydrophobicity since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rutherford et al (US 6,318,124) in view of JP 2001-127152 as applied to claim 1 above, further in view of JP 64-009231. Rutherford does not specifically disclose how the siloxane resin is formed. JP'231, however, teaches siloxane polymer being formed from heat treatment of a mixture containing tetralkoxysilane and trialkoxysilane and alcohol is released from the mixture to form a siloxane polymer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method as taught by JP'231 to produce a siloxane polymer because such is known in the art and JP'231 provides necessary details to practice the invention of Rutherford.

JP'231 does not specifically disclose the molar ratio of tetralkoxysilane and trialkoxysilane as well as the amount of alcohol removed from the mixture. However, such a variable would have been recognized by one skilled in the art as dependent upon the intended use of the product. As such, in the absence of unexpected results, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the molar ratio in the range instantly claimed motivated by the desire to form a siloxane polymer within a short time, thereby giving an insulation film with improved heat resistance, adhesion and cracking resistance since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Response to Arguments

13. The art rejections based on Rutherford in view of JP '152 have been maintained for the following reasons. Applicants argue that it is impossible to combine teachings of the two cited references to achieve the claimed invention because the combination of references lack information would suggest the claimed invention. The examiner respectfully disagrees. The examiner has provided a detailed analysis as to why it is believed that Rutherford is properly combinable with JP '152 (see discussion above). Those arguments are incorporated by the reference. Accordingly, the art rejections are sustained.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Friday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hai Vo

HV

HAI VO
PRIMARY EXAMINER